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Affordability of anti-hypertensive and anti-hypertensive co-morbid with diabetes in Jos and environs, Central Nigeria

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Abstract

Background: Although research has been undertaken on medicine prices, there has so far been insufficient progress in improving medicine affordability and availability for individual patients in many countries. Hypertension is a major risk factor for cardiovascular disease (CVD) such as acute myocardial infarction (AMI), stroke, heart failure and death. WHO has estimated that hypertension alone accounts for 4.4% of all disability adjusted life years that are ranged from NGN1200 to NGN4250. The aim of this study is to do a pharmaco-economic evaluation of hypertension and hypertension comorbid with diabetes medications in selected health facilities in Jos and environs, Central Nigeria.

Patients' income per month was assessed ranging from <20,000.00 to ≥ NGN181, 000.00. The medications presented to the patients first were rotated for different patients to eliminate bias.

There was a relatively higher cost of treatment in Nasarawa compared to Plateau state. The cost of treatment was highest in private facilities, higher in Faith-based institutions than the public facilities. It cost an unskilled labourer between 27 to 45 days wages to treat hypertension (catastrophic). The monthly cost of medication ranges from NGN1000 to NGN3725 cost.

Results show that the monthly cost of treating hypertension ranged from NGN1000 to NGN3000 and NGN1200 to NGN4250 for comorbid cases.

Prices of essential medicines used in the management of hypertension and hypertension comorbid with diabetes is quite high compared with the international reference prices. The treatment in both cases were mostly unaffordable for the threshold of an unskilled labourer and majority of the patients. Policy options towards ameliorating these catastrophic effects as the main focus of government and relevant stakeholders is hereby recommended.

Keywords: Antihypertensives; Affordability; Private institutions; Prices; Public institutions; Faith-based institutions

1. Introduction

The ripple effect of the global economic meltdown on almost every sector of the human society is quite tangible. Access to good food, shelter, transportation, healthcare including drugs has become a big challenge to the low and middle-class

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citizens of the developing countries. Ensuring that medicines are affordable is a factor to be considered in order to counteract existing barriers that might hinder medicine access [1]. The progress achieved so far in improving medicine affordability and availability for individual patient retains the insufficiency status in many countries despite research outcome on same [2]. The 3rd world nations have suffered more from lack of adequate attention to medicine affordability than the developed nations as a result of poverty, poor planning strategies and improper and lack of implementation of relevant policies. Hypertension is a major risk factor for cardiovascular disease (CVD) such as acute myocardial infarction (AMI), stroke, heart failure and death. The WHO has estimated that hypertension alone accounts for 4.4% of all disability adjusted life years that are lost [3]. Although drug therapy is critical to successful treatment of hypertension, adhering to drug therapy has been a challenging task among hypertensive patients. Cost and complexity of drug therapy are considered a major hindrance to medication adherence [4]. Drug therapy is financially burdensome, with constant payments every month. Patients with other comorbid condition such as diabetes or renal disease will need more antihypertensive medications to reach their blood pressure goal as well as take drugs for their comorbid conditions [4]. According to a report in 2010, average cost of for the treatment of hypertension per adult in the United States was 733 dollars [5]. It is important to note that anti-hypertensive therapy reduces the incidence of stroke (35-40%), Myocardial infarction (20-25%) and heart failure (> 50%). Prescription medicine costs account for about half of the total medical costs for the treatment of hypertension [6]. In general, medicines are more affordable in high-income countries than in low-income countries, when adjusted for national or individual income level⁷. In many low and middle-income countries, treatments for acute and chronic illness are largely unaffordable, especially in the private health care sector, and they may be unavailable in the public sector [7]. Equitable access to health care is a key policy goal globally. According to WHO, equity in access is achieved by universal coverage defined as “access to key promotive, preventive, curative and rehabilitative health interventions for all at an affordable cost [8].

The definition of what constitutes an “affordable” price is thus a normative one that, according to some, lacks an economic foundation [9]. A commodity is obviously unaffordable if it costs more than what is in the full (potential) budget, but such a definition is overly restrictive [10]. An average individual in a low- or middle-income country has only a limited amount of resources with which all basic needs such as food, housing, etc. are necessary [11] thus making the amount of money available for healthcare especially medicines so limited that people may forego procurement of essential drugs, go into debt or forego other essential purchases as cost of medicine often exceeds their budget [11]. One way of measuring affordability of drug is to adjust prices by average income per person [1] as it aids in understanding the value of a medicine with respect to the amount of income the average person has available to spend on pharmaceuticals. A new Pharmacy Bill and a Medicines and Related Substances Control Bill have been developed which provides for the establishment of a Pharmacy Council and a Medicines Regulatory Authority [12].

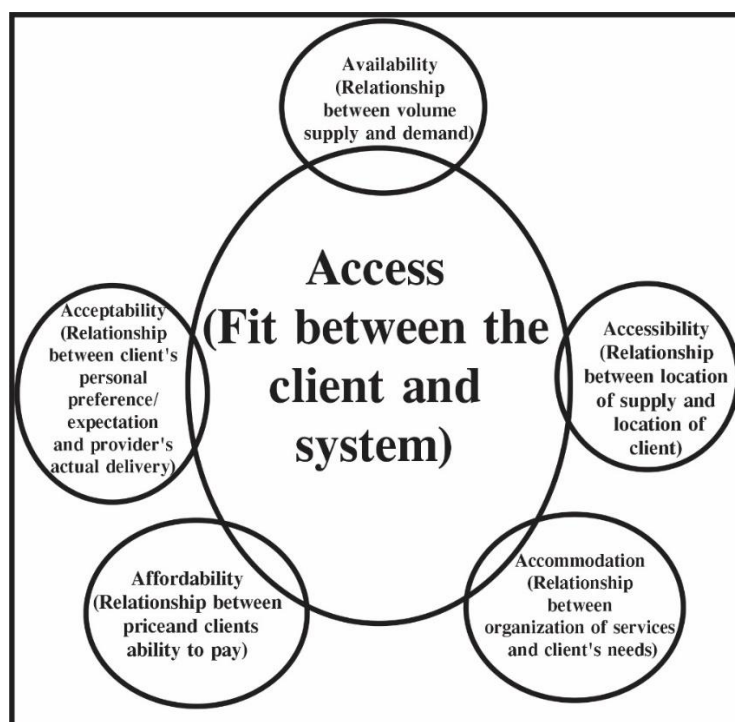


Figure 1 The concept of access: Definition and relationship to consumer satisfaction on medical care (1981) [14]

The theoretical framework upon which this study is predicated centres around the important role of how good distribution systems play in ensuring availability of safe, efficacious, effective and good quality of medicines at all levels of healthcare. The availability, affordability, accommodation, accessibility and acceptability of good quality drugs, coupled with their rational use are fundamental to effective health care delivery in any country [13]. The aim of this study is to do a pharmaco-economic evaluation of hypertension and hypertension comorbid with diabetes medications in some selected health facilities in Nasarawa and Plateau States in North-Central Nigeria.

2. Material and methods

This is a cross sectional survey of the major drug distribution sectors in some selected health facilities in Nasarawa and Plateau States in North-Central Nigeria.

Information was obtained from the pharmacies of public and missionary hospitals, private clinics and community pharmacies with the aid of a data collection sheet to obtain the name of the antihypertensive drugs (branded and generic), the usual quantities and price for a month supply to patients. WHO/HAI data collection format for collection and analysis of medicine prices in public and private sectors [15] was used.

Patients' income per month was assessed ranging from <20,000.00 to ≥ N181, 000.00. The medications presented to the patients first were rotated for different patient to eliminate bias.

2.1. Statistical Analysis

Data was sorted and analysed with SPSS v. 20.

3. Results and discussion

Table 1 Affordability of Antihypertensive and Diabetic Medication

Variable	Sub-group	Median (IQR) Monthly cost of medicine in Naira	Mean rank of monthly cost of medicines	P value
Diagnosis	Hypertension	1650 (1000 - 3000)	730.86	<0.001
	Hypertension + Diabetes	2100 (1200 - 4025)	872.17	
State	Nasarawa	2527 (1230 - 3330)	725.40	<0.001
	Plateau	1650 (980 - 3000)	879.85	
Type of facility	Faith based	1650 (900 - 2825)	747.87	<0.001
	Private	2700 (1500 - 3725)	915.06	
	Public	1579 (1120 - 3000)	714.53	

Table 2 Number of days work required for monthly cost of drugs

Variable		Median (IQR) Number of days wage required for monthly cost of medicines	Mean rank	P value
Diagnosis	Hypertension	27.5 (17 - 50)	730.86	<0.001
	Hypertension+ Diabetes	35 (20 - 67)	872.17	
State	Nasarawa	42 (20.5 - 55.5)	725.40	<0.001
	Plateau	27.5 (16 - 50)	879.85	
Type of HCF	FB	27.5 (15 - 47)	747.87	<0.001
	Private	45 (25 - 62)	915.06	
	Public	26 (19 - 50)	714.53	

The monthly cost of treating hypertension range from NGN1000 to NGN3000. For comorbid cases, it ranged from NGN1200 to NGN4250. There was a relatively higher cost of treatment in Nasarawa compared to Plateau state. The cost of treatment was highest in private facilities followed by faith-based institutions than the public facilities. It cost an unskilled labourer between 27 to 45 days wages to treat hypertension. This is catastrophic as the monthly cost of medication ranges from NGN1000 to NGN3725 – *Table 1*.

Table 3 Respondents who can tolerate cost of Drugs per month

Characteristics	Sub-group	Number (%) of respondents who Can tolerate cost drugs per month		Chi-square (p value)
Marital status	Not married	40 (74.07)	14 (25.93)	1.238 (0.871)
	Government worker	92 (61.74)	57 (38.26)	
Employment status	Self employed	51 (66.23)	26 (33.77)	
	Student and unemployed	10 (62.5)	6 (37.5)	
	Private sector worker	46 (68.66)	21 (31.34)	
	Retired	14 (60.87)	9 (39.13)	

Diabetes and hypertension are the highest burden of non-communicable diseases to populations worldwide [16, 17]. An estimated 366 million and 1 billion people globally are living with diabetes and hypertension respectively [18, 19]. By 2020, prevalence of these diseases is expected to increase between 13% and 30% [16, 17], without more innovative preventive interventions. Global health care expenditures have been rising sharply, and drug costs are a major factor [20]. For low- and middle-income countries (LMIC), drug expenditure can be a critical public health problem [21]. Research has established consistent links between medication nonadherence due to costs and financial burden. From the result findings, 69.4% of patients suffering from hypertension can tolerate cost drugs per month while 30.6% were non tolerant (*Table 4*). Males (66.89%), the aged (45-54), (66.96%), the unmarried (74.07%), private sector worker (68.66%) tolerated better (*Tables 3 and 4*).

Table 4 Respondents who can tolerate cost of drug per month

Characteristics	Sub-group	Number (%) of respondents who Can tolerate cost drugs per month		Chi-square (p value)
		Tolerant	Not tolerant	
Sex	Male	101 (66.89)	50 (33.11)	0.898 (0.343)
	Female	112 (61.88)	69 (38.12)	
Age, years	18-34	9 (56.25)	7 (43.75)	0.909 (0.823)
	35-44	30 (62.5)	18 (37.5)	
	45-54	75 (66.96)	37 (33.04)	
	55+	99 (63.46)	57 (36.54)	
Diagnosis	Hypertension	161 (69.4)	71 (30.6)	11.834 (0.003)
	Diabetes	23 (62.16)	14 (37.84)	
	Hypertension + diabetes	29 (46.03)	34 (53.97)	
	Married	173 (62.23)	105 (37.77)	2.758 (0.097)
Highest education	No formal education	15 (71.43)	6 (28.57)	1.819 (0.611)
	Primary	23 (67.65)	11 (32.35)	
	Secondary	51 (68)	24 (32)	
	Postsecondary	124 (61.39)	78 (38.61)	

Monthly income	<N20,000	15 (62.5)	9 (37.5)	5.158 (0.271)
	N20,000 - 60,000	31 (60.78)	20 (39.22)	
	N61,000 - 100,000	111 (69.38)	49 (30.63)	
	N101,000 - 140,000	40 (61.54)	25 (38.46)	
	>N141,000	16 (50)	16 (50)	

Similarly, 62.16% of the respondents with Diabetes mellitus can tolerate drug cost per month while 37.84% cannot (Table 4). However, the percentage of respondents with comorbid cases who were tolerant to cost drugs per month was 46.03% and 53.97% were non tolerant (Table 4). This lower percentage may be due to healthcare burden. Due to cost concerns, female patients with hypertension, diabetes and hypertension comorbid with diabetes were significantly more likely to skip medication, take less medication compared with their male counterparts. These findings are consistent with other studies that have reported gender differences in patients with other chronic conditions [22, 23]. The cost of medication affects females more than males. The results also suggest a lower percentage of respondents for students, unemployed, and government workers compared to private workers. Medicines were very unaffordable, representing one and half month salary in a private facility. Also, the average cost of treating hypertension for a month would require 27.5day work wage on average and 35day wage was required for hypertensive patient with diabetes, between medicines. Although appropriate use of prescription drugs can substantially improve health status, accessing these treatments may sometimes consume catastrophic proportions of available income [24].

Our study revealed that the issue of affordability of medicines is needs urgent attention with the present economic challenges in Nigeria where most states do not pay its workers the required monthly minimum wage of N30, 000. Government has to wake up to responsibility in this regard. In the USA, States have been highly energetic in passing a range of laws aimed at drug prices, from price transparency requirements to drug affordability boards [25]. A study in Sri Lanka done by Brenda et al. (2014) found out that the affordability of LPGs was generally good for all medicines, with standard treatment costing about day's wage or less than the daily wage of the lowest paid government worker lowest-paid government worker [1].

4. Conclusion

The study showed higher prices of essential medicines used in the management of hypertension and hypertension comorbid with diabetes compared with the international reference prices. The treatment in both cases were mostly unaffordable for the threshold of an unskilled labourer and majority of the patients. Policy options towards ameliorating these catastrophic effects as the main focus of government and relevant stakeholders is hereby recommended.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

Authors hereby declare no conflict of interest of any sort.

Statement of ethical approval

Ethical clearance with Reg no NHREC/09/23/20106, NHREC/21/12/2012 and JUTH/DCS/ ADM/127/ XXV/016 were obtained from the Plateau Specialist Hospital Jos, Nigeria, Federal Medical Center Keffi, Nigeria and Jos University Teaching Hospital Jos, Nigeria respectively.

Statement of informed consent

Not applicable in this section as the obtained ethical clearance covered for it.

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